

WHAT IS CLAIMED IS:

1. A method of administering a synthetic plasma-like solution to a subject in need thereof, said method comprising:
  - (a) reducing the level of CO<sub>2</sub> in said subject; and
  - (b) administering said plasma-like solution to said subject;wherein said method results in a reduced risk of acidosis/acidemia .
2. The method according to Claim 1, wherein said method comprises reducing at least one of the blood level and brain level CO<sub>2</sub> of said subject.
3. The method according to Claim 1, wherein said subject has at least a sub-physiologic blood flow.
4. The method according to Claim 1, wherein said subject is in circulatory arrest.
5. The method according to Claim 1, wherein said subject suffers from hypovolemia.
6. The method according to Claim 1, wherein said subject suffers from hyphemia.
7. The method according to Claim 1, wherein said subject suffers from low blood pressure.
8. The method according to Claim 1, wherein said subject is undergoing surgery.
9. The method according to Claim 8, wherein said surgery is low temperature surgery.
10. The method according to Claim 8, wherein said surgery is stopped heart surgery.
11. The method according to Claim 8, where said surgery includes replacing at

least a portion of the blood of said subject with said synthetic plasma like solution.

12. The method according to Claim 1, wherein said CO<sub>2</sub> level is reduced using a mechanical means.

13. The method according to Claim 1, wherein said CO<sub>2</sub> level is reduced using a pharmacological means.

14. The method according to Claim 1, wherein said synthetic plasma like solution comprises:

electrolytes;

a dynamic buffering system; and

at least one oncotic agent;

wherein said solution does not comprise a biological buffer.

15. The method according to Claim 14, wherein said dynamic buffering system comprises bicarbonate.

16. The method according to Claim 14, wherein said electrolytes of said plasma-like solution comprise sodium, potassium, calcium, chloride ion and magnesium.

17. The method according to Claim 14, wherein said solution further comprises a simple sugar.

18. The method according to Claim 1, wherein said synthetic plasma like solution comprises:

sodium, potassium, calcium, chloride ion and magnesium electrolytes;

bicarbonate; and

at least one starch oncotic agent; and

a simple sugar;

wherein said solution does not comprise a biological buffer.

19. A system for administering a synthetic plasma-like solution to a subject in

need thereof, said system comprising:

- (a) a synthetic plasma-like solution; and
- (b) a means for reducing the CO<sub>2</sub> level of a subject.

20. The system according to Claim 19, wherein said means is a mechanical means.

21. The system according to Claim 19, wherein said means is a pharmacological means.

22. A kit for administering a synthetic plasma-like solution to a subject in need thereof, said system comprising:

- (a) a synthetic plasma-like solution; and
- (b) a means for reducing the CO<sub>2</sub> level of a subject.

23. The kit according to Claim 22, wherein said means is a mechanical means.

24. The kit according to Claim 22, wherein said means is a pharmacological means.

25. The kit according to Claim 22, wherein said kit further comprises instructions for practicing the method of Claim 1.